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more or less rounded pits preceded the transversely elongated pits of the scalariform type in the Filicales.—J. M. C.

**Origin of Sphenophyllales.**—In 1903 LIGNIER<sup>25</sup> published his view that the Equisetales and Sphenophyllales are of filicinean origin. Recently this disposition of the Sphenophyllales has been opposed, especially by SCOTT, and by the anatomical work of Miss SYKES. LIGNIER has now resumed the discussion<sup>26</sup> and reaffirms his former position, with additional argument. He claims that the “fertile leaves” of Sphenophyllum cannot be homologized with the sporangiferous structures of Tmesipteris; but that their “sterile pinnules” are comparable with those Archaeopteris. The “fertile pinnules,” at the same time, are of the same type as those of the Primofilices. Therefore, LIGNIER concludes that the Sphenophyllales ought to be “attached” to the Primofilices and not to the Lycopodiales. A number of secondary characters also are used to strengthen this view.—J. M. C.

**Sieve tubes.**—An elaborate histological investigation of the details of development in sieve tubes of angiosperms has been made by HILL.<sup>27</sup> It appears that the young cell wall which is to form a sieve plate, is at first pitted, the pit-floor being penetrated by one or a group of fine protoplasmic threads, which, after some change of the adjacent cell wall, “begin to be bored out to form slime strings, apparently by a ferment.” These slime strings enlarge and merge, so that finally one large slime string occupies the place of the group. This is always inclosed in a protoplasmic tube, which lines each pore of the plate, and the pore itself has a callus lining covering the cellulose part of the wall. Many further details are given and the usual teleological causes assigned for the processes. The paper contains an excellent historical summary.—C. R. B.

**Hygroscopic movements.**—STEINBRINCK and SCHINZ, by studies on some desert plants, support further the view that the internal structure of the thickened walls, as well as differences in the tissues, are the cause of the warping movements of fruits and other parts.<sup>28</sup> They find that lignified walls really swell and shrink more than cellulose walls, and they attribute to differences in structure the unlike polarization phenomena observed in the walls of different layers of cells in the bending organ. Incidentally they establish the “true” Jericho rose as *Anastatica hierochuntica* L., and not *Odontospermum pygmaeum* (DC.) Benth. & Hook.—C. R. B.

<sup>25</sup> LIGNIER, O., Equisétales et Sphenophyllales. Leur origine filicinéene commune. Bull. Sci. Linn. Normandie V. 7: 93. 1903.

<sup>26</sup> LIGNIER, O., Sur l'origine des Sphénophyllées. Bull. Soc. Bot. France IV. 8: 278–288. 1908.

<sup>27</sup> HILL, A. W., The histology of the sieve tubes of angiosperms. Annals of Botany 22: 245–290. pls. 17, 18. figs. 13. 1908.

<sup>28</sup> STEINBRINCK, C., and SCHINZ, H., Ueber die anatomische Ursache der hygrochastischen Bewegungen der sog. Jerichorosen und einiger anderer Wüstenpflanzen. Flora 98: 471–500. 1908.